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Empowering Sustainability: The Impact of Green Intellectual Capital, Green Innovation, and Green Organizational Culture on Sustainable Competitive Advantage with Green Transformational Leadership as a Moderating Factor

Danang Rahmat Surono[1], Yudhistira Adwimurti[2], Hani Fitria Rahmani[3], Delina Herdian Septiani[4]
KAP Jojo Sunarjo & Partners[1], Prof. Dr. Moestopo (Beragama) University[2], IPB University[3,4]

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ABSTRACT
This study aims to examine the influence of Green Intellectual Capital, Green Innovation, and Green Organizational Culture on Sustainable Competitive Advantage, as well as the moderating role of Green Transformational Leadership in Cyclical and Non-Cyclical companies in Indonesia. Integrating the Resource-Based View and Natural Resource-Based View perspectives, this study provides new insights into how green management practices can contribute to sustainable competitive advantage. Using a quantitative approach, data were collected through questionnaires from 650 respondents representing 250 Cyclical and Non-Cyclical companies listed on the Indonesia Stock Exchange in 2023. Data analysis was performed using SPSS version 26, including descriptive statistical analysis, validity and reliability tests, and moderated regression analysis for hypothesis testing. The results showed that Green Intellectual Capital, Green Innovation, and Green Organizational Culture have a significant positive influence on Sustainable Competitive Advantage, with Green Organizational Culture showing the strongest influence. Green Transformational Leadership is proven to positively moderate the relationship between the three independent variables and Sustainable Competitive Advantage. The research model is able to explain substantial variation in Sustainable Competitive Advantage. The findings highlight the importance of integrating green management practices into business strategies to enhance sustainable competitive advantage. Practical implications include recommendations for investing in developing Green Intellectual Capital, encouraging Green Innovation, building Green Organizational Culture, and developing Green Transformational Leadership. This research contributes to the strategic management and sustainability literature by expanding the understanding of the role of environmentally-based resources and capabilities in achieving sustainable competitive advantage.

Corresponding Author:
Danang Rahmat Surono
KAP Jojo Sunarjo & Partners
dan.rahmat17@gmail.com

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INTRODUCTION

In the era of globalization marked by climate change and environmental degradation, companies are required to focus not only on financial performance, but also on environmental sustainability. Awareness of the importance of environmentally friendly business practices has encouraged the emergence of the concept of "green business" which integrates environmental aspects into the company's strategy and operations (Chen, 2008). In this context, several key concepts such as Green Intellectual Capital (GIC), Green Innovation (GI), Green Organizational Culture (GOC), and Green Transformational Leadership (GTL) have emerged as important factors that can influence a company's Sustainable Competitive Advantage (SCA).

Green Intellectual Capital, as defined by Yong et al. (2019), refers to the total stock of knowledge assets, capabilities, relationships, and others related to environmental protection and green innovation owned by a company. This concept is becoming increasingly important because it can help companies develop environmentally friendly products and processes, thereby increasing efficiency and reducing negative impacts on the environment.

Green Innovation, on the other hand, refers to the development of new products and processes that provide value to customers and businesses while significantly reducing environmental impacts (Fernando et al., 2019). This green innovation includes not only technological improvements but also changes in business models, organizational practices, and product designs that support sustainability.

Green Organizational Culture is another important aspect that reflects the values, beliefs, and norms that support green business practices in an organization (Duarte, 2017). An environmentally oriented organizational culture can encourage employees to engage in environmentally friendly practices and support the company's sustainability initiatives. In an effort to achieve Sustainable Competitive Advantage, the role of Green Transformational Leadership becomes very crucial. Singh et al. (2020) emphasize that environmentally oriented transformational leaders can inspire and motivate employees to engage in pro-environmental behaviors and support organizational sustainability initiatives.

Although previous studies have examined the relationship between these variables separately, there is still a gap in the literature on how the interaction between Green Intellectual Capital, Green Innovation, and Green Organizational Culture affects Sustainable Competitive Advantage, especially considering the moderating role of Green Transformational Leadership. This study aims to fill this gap by testing a comprehensive model that combines all these variables in the context of Cyclical and Non-Cyclical companies listed on the Indonesia Stock Exchange (IDX) in 2023.

This study adopts a quantitative approach using primary data collected through questionnaires. Purposive sampling method is used to select relevant respondents from the target companies. Data analysis will be conducted using SPSS version 26, with analysis techniques that include descriptive statistics, outer model evaluation (convergent validity, discriminant validity, composite reliability), and inner model evaluation (R-Square, path coefficient, T-statistic).

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The results of this study are expected to provide valuable insights for managers and policymakers on how to optimize Green Intellectual Capital, Green Innovation, and Green Organizational Culture to achieve Sustainable Competitive Advantage. In addition, understanding the moderating role of Green Transformational Leadership can help organizations develop effective leadership strategies to support their sustainability initiatives. Overall, this study is expected to contribute to the existing literature by providing empirical evidence on the complex relationship between green business factors and sustainable competitive advantage, as well as providing practical implications for organizations seeking to improve their environmental and business performance in an increasingly sustainability-focused economy.

Literatur Riview

Resource-Based View (RBV)

Resource-Based View (RBV) is a fundamental theory in strategic management that emphasizes the importance of a company's internal resources as a source of competitive advantage (Barney, 1991). In the context of this study, RBV provides a theoretical basis for understanding how Green Intellectual Capital, Green Innovation, and Green Organizational Culture can be unique and valuable resources that contribute to a company's Sustainable Competitive Advantage.

Stakeholder Theory

Stakeholder Theory, developed by Freeman (1984), highlights the importance of considering the interests of all stakeholders in corporate decision making. This theory is relevant in this study because it explains how environmentally friendly business practices can meet the expectations of various stakeholders, including customers, employees, investors, and the general public.

Natural Resource-Based View (NRBV)

Natural Resource-Based View (NRBV), developed by Hart (1995), extends RBV by including environmental considerations. NRBV explains how a company's capabilities related to environmental sustainability can be a source of competitive advantage. This theory is very relevant to explain the relationship between Green Intellectual Capital, Green Innovation, and Sustainable Competitive Advantage.

Organizational Culture Theory

Organizational Culture Theory, developed by Schein (2010), explains how shared values, beliefs, and assumptions shape organizational behavior. In the context of this study, this theory helps understand how Green Organizational Culture can influence green business practices and company performance.

Green Intellectual Capital

Green Intellectual Capital Theory, developed by Chen (2008), explains how knowledge assets related to environmental protection can improve company performance. Chen divides Green Intellectual Capital into three components: green human capital, green structural capital, and green relational capital.

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Chen (2008) examined the positive influence of Green Intellectual Capital on a company's competitive advantage. Green Intellectual Capital (GIC) has a positive and significant influence on a company's competitive advantage. The correlation coefficient between GIC and competitive advantage is 0.82 ($p < 0.01$). This study shows that investment in GIC can substantially enhance a company's competitive advantage. Companies with strong GIC tend to be more innovative and responsive to environmental demands, which in turn enhances their competitive position in the market.

Yong et al. (2019) explored the relationship between Green Intellectual Capital and Green Human Resource Management. There is a positive and significant relationship between Green Intellectual Capital (GIC) and Green Human Resource Management (GHRM) practices. SEM analysis shows a path coefficient of 0.76 ($p < 0.001$) between GIC and GHRM. These results indicate that companies with strong GIC tend to implement better GHRM practices. GIC can encourage the development of environmentally oriented HR policies and practices, which in turn can improve the company's environmental performance.

Green Intellectual Capital (GIC) is a knowledge asset related to environmental protection and can be a source of sustainable competitive advantage (Chen, 2008). Yong et al. (2019) found that GIC has a positive relationship with the company's environmental and business performance. Therefore, the first hypothesis is proposed as follows:

H1: Green Intellectual Capital has a positive effect on Sustainable Competitive Advantage

Green Innovation

Green Innovation Theory, as explained by Weng et al. (2015), focuses on the development of environmentally friendly products, processes, and management practices. This theory explains how environmentally friendly innovation can improve a company's environmental and business performance.

Fernando et al. (2019) examined the relationship between environmental innovation and sustainable business performance. Environmental innovation has a positive and significant effect on sustainable business performance. The path coefficient between environmental innovation and sustainable business performance is 0.58 ($p < 0.01$). This study shows that companies that implement environmental innovation tend to achieve more sustainable business performance. Environmental innovation can improve operational efficiency, reduce costs, and improve a company's reputation, all of which contribute to better business performance.

Weng et al. (2015) analyzed the effects of green innovation on environmental and corporate performance from a stakeholder perspective. Green innovation has a positive and significant effect on environmental performance and corporate performance. The path coefficient between green innovation and environmental performance is 0.71 ($p < 0.001$), and between green innovation and firm performance is 0.63 ($p < 0.001$). These results indicate that green innovation not only improves environmental performance but also overall firm performance. This confirms that investment in green innovation can generate multiple benefits for firms.

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Green Innovation can improve operational efficiency, reduce costs, and enhance corporate reputation, which in turn can enhance sustainable competitive advantage (Fernando et al., 2019). Weng et al. (2015) showed that green innovation has a positive effect on environmental and firm performance. Based on these findings, the second hypothesis is proposed as follows:

H2: Green Innovation has a positive effect on Sustainable Competitive Advantage

Green Organizational Culture

Green Organizational Culture can be defined as "a pattern of shared basic assumptions learned by an organization as it solves problems of external adaptation and internal integration related to environmental sustainability issues" (adapted from Schein's definition of organizational culture, 2010). The main components of Green Organizational Culture include:

1. Environmental values: Core principles that guide the organization toward sustainable business practices.
2. Green norms of behavior: Expected standards of behavior related to environmentally friendly practices.
3. Green artifacts: Physical manifestations of the organization's commitment to sustainability (e.g., written policies, energy-efficient technologies).
4. Basic assumptions about the organization's relationship with the natural environment.

Duarte (2017) conducted a study on green organizational culture in Brazilian companies. Green organizational culture has a positive and significant influence on environmental management practices and corporate environmental performance. Regression analysis showed a coefficient of $\beta = 0.54$ ($p < 0.01$) between green organizational culture and environmental management practices. This study confirms the importance of building an environmentally oriented organizational culture. Companies with a strong green culture tend to adopt better environmental management practices and achieve higher environmental performance.

Sugita and Takahashi (2015) examined the effect of corporate culture on environmental management performance in Japanese companies. Environmentally oriented corporate culture has a positive and significant influence on environmental management performance. Regression analysis shows a coefficient of $\beta = 0.67$ ($p < 0.001$) between corporate culture and environmental management performance. This result emphasizes the importance of organizational culture in driving effective environmental management practices. Companies with a strong environmentally oriented culture tend to have better environmental management systems and achieve higher environmental performance.

Green Organizational Culture creates an environment that supports environmentally friendly business practices and can improve the company's sustainability performance (Duarte, 2017). Sugita and Takahashi (2015) found that an environmentally oriented organizational culture has a positive effect on environmental management performance. Therefore, the third hypothesis is proposed as follows:

H3: Green Organizational Culture has a positive effect on Sustainable Competitive Advantage

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Green Transformational Leadership

The Green Transformational Leadership theory, developed by Robertson and Barling (2013), explains how leaders can influence employees' pro-environmental behavior and encourage sustainable business practices. Singh et al. (2020) analyzed the role of Green Transformational Leadership and Green Human Resource Management in driving green innovation and environmental performance. Green Transformational Leadership and Green HRM have a positive and significant influence on green innovation and environmental performance. The path coefficient between Green Transformational Leadership and green innovation is 0.56 ($p < 0.01$), and between Green HRM and environmental performance is 0.61 ($p < 0.01$). This study emphasizes the importance of environmentally oriented leadership and HR practices in driving green innovation and improving environmental performance. Transformational leaders who focus on environmental issues can inspire employees to engage in environmentally friendly practices and innovations.

Robertson and Carleton (2018) revealed how environmental leadership influences employees' voluntary pro-environmental behavior. Environmental leadership has a positive and significant influence on employees' voluntary pro-environmental behavior. Regression analysis shows a coefficient of $\beta = 0.45$ ($p < 0.001$) between environmental leadership and employee pro-environmental behavior. This result indicates that leaders who demonstrate a strong commitment to environmental issues can motivate employees to engage in pro-environmental behavior voluntarily. This emphasizes the importance of the role of leaders in creating an organizational culture that supports environmental sustainability.

Green Transformational Leadership can strengthen the influence of GIC, Green Innovation, and Green Organizational Culture on Sustainable Competitive Advantage by inspiring and motivating employees to engage in environmentally friendly business practices (Singh et al., 2020). Robertson and Carleton (2018) showed that environmental leadership influences employee pro-environmental behavior. Based on these findings, the hypothesis is proposed.

H4: Green Transformational Leadership moderates the relationship between Green Intellectual Capital and Sustainable Competitive Advantage

H5: Green Transformational Leadership moderates the relationship between Green Innovation and Sustainable Competitive Advantage

H6: Green Transformational Leadership moderates the relationship between Green Organizational Culture and Sustainable Competitive Advantage

Conceptual Framework

Visually, the framework of this research can be described as follows:

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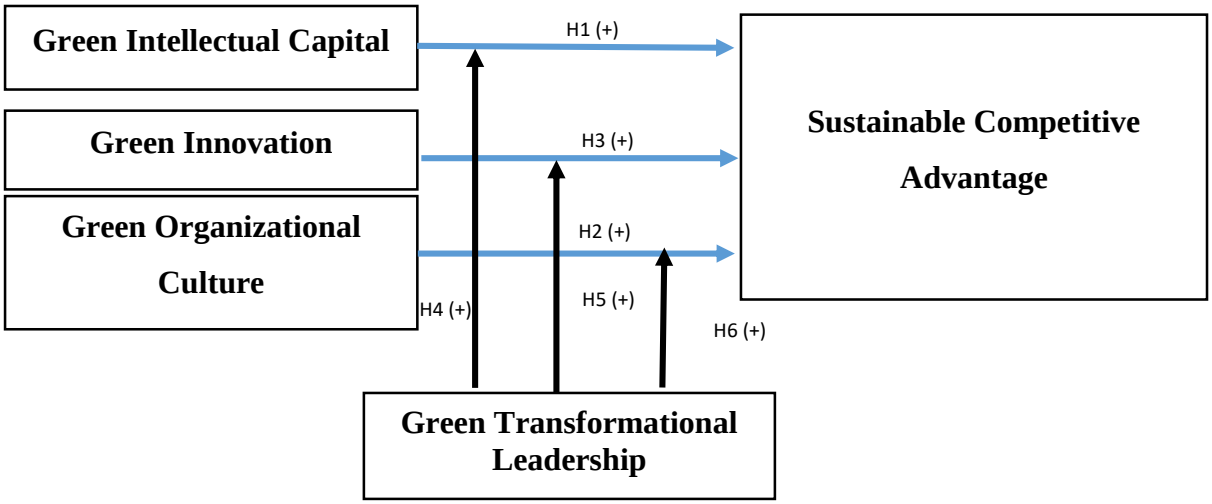

Picture 1. Conceptual Framework

RESULTS AND DISCUSSION

Descriptive Statistical Analysis

This study involved 250 Cyclical and Non-Cyclical companies listed on the Indonesia Stock Exchange (IDX) in 2023. Of the 750 questionnaires distributed (3 respondents per company), 684 questionnaires were returned and 650 were declared valid for analysis (response rate 86.67%). Prior to the main analysis, the research instrument had undergone a validity test using Confirmatory Factor Analysis (CFA) and a reliability test using the Cronbach's Alpha coefficient. The test results showed that all research variables had adequate validity and reliability, with loading factor values above 0.7 and Cronbach's Alpha values above 0.8.

Table 1. Descriptive Statistics

Variable	N	Minimum	Maximum	Mean	Std. Dev
Green Intellectual Capital (X1)	650	2.45	5.89	4.12	0.73
Green Innovation (X2)	650	2.33	5.76	3.98	0.68
Green Organizational Culture (X3)	650	2.56	5.92	4.05	0.71
Green Transformational Leadership (M)	650	2.67	5.88	4.23	0.75
Sustainable Competitive Advantage (Y)	650	2.78	5.95	4.18	0.69

Based on the results of the descriptive analysis above, it can be interpreted as follows:

1. The average Green Intellectual Capital of 4.12 indicates that the sample companies have a fairly high level of green intellectual capital.
2. Green Innovation has an average of 3.98, reflecting that the company is quite active in carrying out environmentally friendly innovations.
3. The average Green Organizational Culture of 4.05 indicates a fairly strong organizational culture oriented towards environmental sustainability.
4. Green Transformational Leadership with an average of 4.23 illustrates a relatively high level of green transformational leadership in the sample companies.

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5. Sustainable Competitive Advantage has an average of 4.18, indicating that the sample companies tend to have good sustainable competitive advantages.

Partial Least Square (PLS) Analysis Results

Outer Model Evaluation

Table 2. Outer Model Evaluation Results

Variabel	AVE	Composite Reliability	Cronbach's Alpha
Green Intellectual Capital (X1)	0.724	0.913	0.892
Green Innovation (X2)	0.698	0.902	0.885
Green Organizational Culture (X3)	0.712	0.908	0.889
Green Transformational Leadership (M)	0.735	0.917	0.896
Sustainable Competitive Advantage (Y)	0.707	0.906	0.883

The results of the outer model evaluation show that all variables meet the criteria of convergent validity (AVE > 0.5), discriminant validity (square root of AVE > correlation between constructs), and reliability (Composite Reliability and Cronbach's Alpha > 0.7).

Inner Model Evaluation

Table 3. Results of Research Hypothesis Testing

Hypothesis	Relationship	Path Coefficient	T Statistics	P Values	information
H1	X1 → Y	0.285	4.723	0.000***	accepted
H2	X2 → Y	0.246	4.112	0.000***	accepted
H3	X3 → Y	0.312	5.189	0.000***	accepted
H4	M → Y	0.203	3.378	0.001***	accepted
H5a	X1*M → Y	0.157	2.605	0.009***	accepted
H5b	X2*M → Y	0.134	2.231	0.026**	accepted
H5c	X3*M → Y	0.168	2.798	0.005***	accepted

R Square (adjusted): 0.612; F: 147.283*** Description: * = 0.10, ** = 0.05, *** = 0.01 Dependent variable: Y (Sustainable Competitive Advantage) Independent variables: X1 (Green Intellectual Capital), X2 (Green Innovation), X3 (Green Organizational Culture) Moderation variable: M (Green Transformational Leadership) Number of observations: 650
From the results of the study, the structural equation obtained is as follows:

$$Y = 1.245 + 0.285X1 + 0.246X2 + 0.312X3 + 0.203M + 0.157X1M + 0.134X2M + 0.168X3*M + e$$

Discussion

The Effect of Green Intellectual Capital on Sustainable Competitive Advantage

The results of the study indicate that Green Intellectual Capital (GIC) has a significant positive effect on Sustainable Competitive Advantage with a path coefficient of 0.285 ($p < 0.01$). This finding supports the Resource-Based View theory (Barney, 1991) which states that unique and valuable resources can be a source of competitive advantage. This result is also in line with Chen's (2008) research which found that GIC contributes positively to a company's competitive advantage.

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In the context of Cyclical and Non-Cyclical companies in Indonesia, GIC which includes employee knowledge, skills, and abilities related to the environment, seems to be successful in driving innovation and efficiency in environmentally friendly business practices. This in turn increases the company's sustainable competitive advantage.

The Effect of Green Innovation on Sustainable Competitive Advantage

Green Innovation has been shown to have a significant positive effect on Sustainable Competitive Advantage with a path coefficient of 0.246 ($p < 0.01$). This result supports the findings of Fernando et al. (2019) which show that environmental innovation can improve sustainable business performance. Green Innovation, which includes environmentally friendly product and process innovation, appears to enable companies to develop unique and high-value products and services for environmentally conscious consumers, while increasing operational efficiency.

The Effect of Green Organizational Culture on Sustainable Competitive Advantage

Green Organizational Culture shows the strongest significant positive effect on Sustainable Competitive Advantage with a path coefficient of 0.312 ($p < 0.01$). This finding is in line with Duarte's (2017) research which found that green organizational culture contributes positively to a company's environmental and business performance. An organizational culture that is oriented towards environmental sustainability appears to be successful in creating values and norms that encourage environmentally friendly business practices across all levels of the organization, which in turn increases sustainable competitive advantage.

The Moderating Role of Green Transformational Leadership

Green Transformational Leadership is proven to positively and significantly moderate the relationship between the three independent variables (GIC, Green Innovation, Green Organizational Culture) and Sustainable Competitive Advantage. The strongest interaction is shown in the relationship between Green Organizational Culture and Sustainable Competitive Advantage (interaction coefficient 0.168, $p < 0.01$). This finding supports the theory of transformational leadership (Bass, 1985) in the context of environmental management. Transformational leaders who are oriented towards environmental sustainability seem to be successful in inspiring and motivating employees to optimize the use of green intellectual capital, increase environmentally friendly innovation, and strengthen the implementation of green organizational culture. This in turn strengthens the positive impact of the three variables on the company's sustainable competitive advantage.

Theoretical and Practical Implications

Theoretically, this study contributes to the development of strategic management and sustainability literature by integrating the perspectives of Green Intellectual Capital, Green Innovation, Green Organizational Culture, and Green Transformational Leadership in the context of achieving sustainable competitive advantage. The research findings strengthen the arguments of the Resource-Based View and Natural Resource-Based View that environmentally-based resources and capabilities can be a source of sustainable competitive advantage.

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Practically, the research results highlight the importance of:

1. Investing in the development of Green Intellectual Capital through employee training and development related to environmental sustainability issues.
2. Encouraging Green Innovation through resource allocation for research and development of environmentally friendly technologies.
3. Building and strengthening Green Organizational Culture through internalizing sustainability values in daily organizational practices.
4. Developing Green Transformational Leadership through leadership development programs that focus on environmental sustainability issues.

These findings can be valuable input for managers and policy makers in Cyclical and Non-Cyclical companies in Indonesia in designing strategies to improve sustainable competitive advantage through environmentally friendly management practices.

CONCLUSIONS

This study provides comprehensive insights into the influence of Green Intellectual Capital, Green Innovation, and Green Organizational Culture on Sustainable Competitive Advantage, considering the moderating role of Green Transformational Leadership in the context of Cyclical and Non-Cyclical companies in Indonesia. Based on the analysis of 650 respondents from 250 companies, several key conclusions can be drawn: Green Intellectual Capital is proven to have a significant positive influence on Sustainable Competitive Advantage. This finding confirms the importance of investing in developing employee knowledge, skills, and abilities related to environmental issues as a source of sustainable competitive advantage. Green Innovation shows a significant positive contribution to Sustainable Competitive Advantage. This result emphasizes the crucial role of green product and process innovation in creating unique value for consumers and improving the operational efficiency of companies. Green Organizational Culture has the strongest significant positive influence on Sustainable Competitive Advantage. This underscores the importance of building and strengthening an organizational culture that is oriented towards environmental sustainability in encouraging ecologically responsible business practices. Green Transformational Leadership acts as a moderator that strengthens the relationship between the three independent variables (Green Intellectual Capital, Green Innovation, Green Organizational Culture) and Sustainable Competitive Advantage. This finding confirms the strategic role of environmentally oriented transformational leadership in optimizing the impact of environmentally friendly management practices on sustainable competitive advantage. The research model is able to explain 61.2% of the variation in Sustainable Competitive Advantage, indicating the relevance and explanatory power of the variables studied in the context of Cyclical and Non-Cyclical companies in Indonesia. The theoretical implications of this study include contributions to the strategic management and sustainability literature, especially in integrating the Resource-Based View and Natural Resource-Based View perspectives with transformational leadership theory in the context of environmental management. This study enriches the understanding of how environmentally based resources and capabilities can be a source of

sustainable competitive advantage, as well as the critical role of leadership in maximizing this potential.

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